

REMARKS

These remarks are in response to the Office Action mailed December 13, 2004. The specification has been amended to remove parenthetical references as requested by the Examiner. The specification has been amended to make reference to reference numerals 1-5 as shown in FIG.2. Support for the amendments to the specification (Fig. 2) can be found in Proc. Natl. Acad. Sci., 96, 7330-7335, 1999, Figure 1A as incorporated by reference in the present application. Claims 1, 5, 7, 10, and 12 have been amended. Support for the amendments can be found throughout the specification as filed. No new matter is believed to have been introduced.

I. IN THE DRAWINGS

The drawing of Figure 2 is objected to as allegedly failing to comply with 37 C.F.R. 1.84(p)(5). Applicants have amended the specification to make reference to characters 1-5. No new matter has been introduced.

Figures 2-8 allegedly show "prior art" and thus should be designated as such. Applicants respectfully traverse.

Applicants are unaware of any statute that requires a drawing, or any element thereof, to be identified as "prior art," or "new," or any combination thereof. Applicants invite the Examiner to clarify this objection. Absent such clarification, Applicants submit that the drawings as currently labeled satisfy the requirements of 37 CFR §1.81. Furthermore, Applicants submit that the Proc. Natl. Acad. Sci., 96, 7330-7335, 1999, is not prior art to the present invention.

II. IN THE SPECIFICATION

The specification is objected to for the use of numbers in parentheses throughout the specification as well as for the use of MATRIGEL, a trademark. Applicants have amended the specification. Accordingly, the objections may be properly withdrawn.

III. IN THE TITLE

The title is allegedly not descriptive of the invention. Applicants have amended the title as suggested by the Examiner.

IV. OBJECTION TO THE CLAIMS

Claims 1 and 5 are objected to for minor informalities due to grammatical errors and punctuation. Claims 1 and 5 have been amended to correct these informalities. Accordingly, the objections may be properly withdrawn.

V. REJECTION UNDER 35 U.S.C. §112, FIRST PARAGRAPH

Claim 1 stands rejected under 35 U.S.C. §112, first paragraph, because the specification while being enabling for a method of constructing a vascularized kidney tissue comprising tubularized metanephric epithelium and metanephric mesenchyme, allegedly does not reasonably provide enablement for a method for constructing a functional mammalian organ. The specification allegedly does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Applicants respectfully traverse this rejection.

The preamble to claim 1 has been amended. Applicants believe that this overcomes the rejection. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claim 10 stands rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. The claim allegedly contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Office Action alleges that Applicants must overcome the issue of transplant rejection in order to provide enablement of the claimed subject matter. Applicants respectfully traverse this rejection.

There are currently numerous issued patents that claim transplantation of xenogenic tissue, allogeneic tissue, autologous tissue, artificial tissue, and mechanical devices that have not been required to overcome tissue rejection. It appears that the Patent Office is requiring Applicants to overcome transplant rejection while allowing others to obtain patents directed to similar methods of transplantation.

As concerns the breadth of a claim relevant to enablement, the only relevant concern should be whether the scope of enablement provided to one skilled in the art by the disclosure is commensurate with the scope of protection sought by the claims. *In re Moore*, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971); MPEP §2164.08. Further the scope of enablement must only bear a "reasonable correlation" to the scope of the claims. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). Applicants respectfully submit that claim 10 bears a reasonable correlation to the subject matter of claim 1, to the teachings of the specification and to the knowledge and ability of one of skill in the art to transplant tissue (e.g., cartilage tissue, vascular graft tissue, skin tissue, tissue-engineered products, mechanical devices and the like). Accordingly, Applicants respectfully request withdrawal of the rejection of claim 10.

Claim 6 stands rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. The claim allegedly contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors at the time the application was filed, had possession of the claimed invention. Applicants respectfully traverse this rejection.

The Office Action admits that Applicants have provided conditioned growth medium that comprises a growth promoting constituent and/or inducer of differentiation (see, e.g., the Office Action at page 7). Applicants claim 6 recites, ". . . wherein the added conditioned medium comprise a growth promoting constituent or inducer of differentiation or morphogenesis." Applicants submit that claim 6 is not claiming the constituent, but merely further defining the "conditioned medium" as comprising such a constituent. Applicants submit that the specification teaches that the conditioned growth medium induces growth/differentiation/morphogenesis. Thus, Applicants were in possession of a growth medium comprising factors that induced growth/differentiation/morphogenesis as recited by claim 6. Thus, the claim is enabled by the specification. Accordingly, Applicants respectfully request withdrawal of this rejection.

VI. REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claim 1 stands rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse this rejection.

Claim 1 has been amended to set forth a numbering scheme as suggested by the Examiner. Applicants submit that the number should not be construed as the order in which the method must occur. For example, parts 1(a) and 1(b) may be

exchanged in the order of the claim without departing from the spirit and scope of the invention.

The Office Action alleges that the term "nutrient rich medium". Applicants have amended claim 1, to more clearly set forth the invention. The term "nutrient rich medium" has been removed and the claim language now recites medium (e.g., medium comprising electrolytes) wherein serum, growth factors and conditioned medium are also present.

The Office Action further alleges that it is unclear what mesenchyme is being dissected. Applicants have amended claim 1 to further clarify the invention. Applicants submit that upon culturing the embryonic or fetal metanephric mesenchyme is a cultured mesenchyme.

Claim 1 is further rejected under 35 U.S.C. §112, second paragraph as allegedly being incomplete for omitting essential steps. In particular the Office Action alleges that because Applicants teach the use of ECM and polycarbonate membrane inserts that such elements should be included in the claims. Applicants submit that the methods recited in the claims satisfy the steps necessary for the invention.

The Office Action further alleges that a mix of growth factors appear to be necessary for the invention. Applicants respectfully direct the Examiner to page 24, lines 20-23, which indicates that BSN-CM plus GDNF was sufficient to induce branching morphogenesis. Thus, a "mix" is not critical for the success of the invention.

The Office Action alleges that claim 6 fails to particularly point out and distinctly claim the invention. Applicants respectfully traverse this rejection.

The Office Action admits that Applicants have provided conditioned growth medium that comprises a growth promoting constituent and/or inducer of

differentiation (see, e.g., the Office Action at page 7). Applicants claim 6 recites, ". . . wherein the added conditioned medium comprise a growth promoting constituent or inducer of differentiation or morphogenesis." Applicants submit that claim 6 is not claiming the constituent, but merely further defining the "conditioned medium" as comprising such a constituent. Applicants submit that the specification teaches that the conditioned growth medium induces growth/differentiation/morphogenesis. Thus, Applicants were in possession of a growth medium comprising factors that induced growth/differentiation/morphogenesis as recited by claim 6. Thus, the claim is enabled by the specification. Accordingly, Applicants respectfully request withdrawal of this rejection.

Rejections and claims not specifically addressed under this section have been amended or otherwise addressed in the foregoing remarks. Applicants believe that the amendments and foregoing remarks overcome the rejections under 35 U.S.C. §112, second paragraph. Accordingly, Applicants respectfully request withdrawal of the rejections.

VII. REJECTION UNDER 35 U.S.C. §103

Claims 1, 5-7 and 12 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Sakurai et al. (PNAS 1997) in view of Sariola et al. (U.S. Patent No. 5,882,923). Applicants respectfully traverse this rejection.

Applicants respectfully submit that the Examiner is using hindsight to arrive at the claimed invention. For example, the Office Action alleges that it would have been obvious to arrive at Applicants' invention based upon the reading of Sakurai et al. because it would have been obvious to "one of ordinary skill in the art at the time the invention was made to produce vascularized mesenchyme by any appropriate method." (See, page 15, second paragraph). Applicants submit that with such global knowledge imputed to one of skill in the art it would be obvious in hindsight to arrive at almost any invention with the mere motivation of "any appropriate method".

As recognized by the Examiner the methods and Sakurai et al. are different that those presently claimed (see, e.g., page 16).

Furthermore, Applicants submit that Sakurai et al. do not teach or suggest the combination of GDNF and BSN-CM as recited in claim 1. The Examiner alleges at page 16 of the Office Action that Sakurai et al. teach and suggest such a combination. However, Applicants direct the Examiner to Figure 5 (page 6283 of Sakurai et al.) in which Sakurai et al. teach and suggest only the use of each growth factor alone or the growth factor in combination (i.e., GF-mix) without BSN-CM. In contrast, one of skill in the art upon reading Sakurai et al., would not have been motivated to use GDNF as this growth factor alone had only minimal activity compared to IGF and FGF (see, e.g., FIG. 5 of Sakurai et al.). Thus, there would have been no motivation to combine GDNF with BSN-CM as currently recited in Applicants' claims.

In order to overcome this deficiency, the Examiner appears to combine Sakurai et al. with Sariola et al. Sariola et al. do not teach or suggest BSN-CM. Sariola et al. do not add anything to the teachings of Sakurai et al. Sakurai et al. teaches and suggests that GDNF has very limited morphogenic ability compared to other growth factors. In fact, one of skill in the art would recognize upon reading Sakurai et al. in view of Sariola et al. that GDNF is a poor morphogenic factor (see, FIG. 5). Applicants submit that the data presented in Sakurai et al. clearly demonstrate that other factors (e.g., IGF, FGF) have far better UB morphogenic effects than GDNF. Accordingly, one of skill in the art would not have been motivated to combine GDNF with BSN-CM as recited in the present claims. In fact, Sakurai et al. actually teaches away from the use of GDNF because of its poor morphogenic effects on UB cells.


Applicants submit that there is no motivation to combine the references to arrive at Applicants' invention. Applicants submit that Sakurai et al. actually teaches away from Applicants' invention. The motivation to arrive at Applicants' invention can only be found in hindsight reconstruction particularly where, as the case is here,

the teachings clearly indicate that GDNF is a poor morphogenic factor. For at least the foregoing reasons, Applicants submit that Applicants invention is non-obvious over the cited references. Accordingly, Applicants respectfully request withdrawal of the rejection.

No fee is believed to be due with respect to the filing of the present response. However, the Commission is authorized to charge any required fee, or credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

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Date: March 11, 2005

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